(127) by a pin (128). Further structures can be used instead of the link (126) which can allow some lost motion between the arm (21) and the subframe (127). Also, of course, this link structure (126) could be on both ends of the subframe (127) or on the trailing end instead of the leading end in order to permit the idler arms (23) and (33) to move to the position shown in FIG. 11 and between the position shown in FIGS. 8 and 11 as is needed for proper operation of the device. Otherwise, the apparatus shown in FIGS. 8–10 works exactly like the embodiment shown in FIGS. 1–7, with the same control system being utilized.

Accordingly, it will be appreciated that the preferred embodiment disclosed herein does indeed accomplish the aforementioned objects. Obviously many modifications and variations of the present invention are possible in light of the above teachings. For example, the hydraulic cylinder could be placed below the pivot pins (22 and 32) on the leading and trailing swing arms (21 and 31) instead of being up higher on extensions of the swing arm members where they are shown in FIGS. 2 and 3. It is therefore to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

I claim:

1. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track;

a leading idler arm operatively pivotally attached to said frame;

a leading idler wheel in engagement with said track and rotatably mounted to one end of said leading idler arm;

a trailing idler arm operatively pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to one end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms;

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position; and

cushioning means associated with said interconnecting structure for providing a shock absorbing function when said leading and trailing idler wheels move with respect to each other due to pivoting of said idler arms when irregular surfaces are encountered by said track, said cushioning means comprising a fluid control device operably attached at one end thereof to one of said idler arms and operatively attached at the other end thereof to the other one of said idler arms.

2. The apparatus of claim 1 including accumulator means for permitting fluid to move out of said fluid control device and into said accumulator means when an obstruction is encountered by one of said idler wheels.

3. The apparatus of claim 2 including means for temporarily disconnecting said fluid control device from said accumulator means whereby the cushioning function will be discontinued for use in soft ground.

4. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track;

a leading idler arm operatively pivotally attached to said frame;

a leading idler wheel in engagement with said track and rotatably mounted to one end of said leading idler arm;

a trailing idler arm operatively pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to one end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms;

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position;

cushioning means associated with said interconnecting structure for providing a shock absorbing function when said leading and trailing idler wheels move with respect to from each other due to pivoting of said idler arms when irregular surfaces are encountered by said track;

means for sensing the relative pivotal position of said leading and trailing swing arms; and

means associated with said sensing means for causing said swing arms to return to said predetermined position after having moved from said predetermined position due to performing a shock absorbing function.

5. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track;

a leading idler arm operatively pivotally attached to said frame;

a leading idler wheel in engagement with said track and rotatably mounted to one end of said leading idler arm;

a trailing idler arm operatively pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to one end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms;

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position; and

means for operably releasing said interconnecting structure whereby said idler arms can freely pivot, thereby causing the lower part of said track to be supported only by said mid-roller assembly whereby a shorter support surface on the bottom of said track will facilitate easier turning.

6. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track;

a leading idler arm operably pivotally attached to said frame;

a leading idler wheel in engagement with said track and

rotatably mounted to one end of said leading idler arm;

a trailing idler arm operably pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to one end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms;

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position; and

wherein said drive wheel extends below a top portion of said mid-roller assembly.

7. The apparatus of claim 6 wherein said mid-roller assembly includes a plurality of rollers on both sides of said drive wheel.

8. The apparatus of claim 7 wherein said mid-roller assembly is also operatively attached to the other one of said idler arms.

9. The apparatus of claim 8 wherein said mid-roller assembly is pivotally attached to one of said idler arms at one end thereof.

10. The apparatus of claim 9 wherein said mid-roller assembly is operably pivotally attached at the other end thereof to the other one of said idler arms.

11. The apparatus of claim 9 wherein a link member is operatively pivotally attached at one end thereof to the other end of said mid-roller assembly and is operatively pivotally attached at the other end thereof to the other one of said idler arms thereby allowing said leading and trailing idler wheels to move toward or away from each other while said mid-roller assembly supports a lower part of said track.

12. The apparatus of claim 6 wherein said drive wheel is at least one and one half times as large in diameter as the diameter of said leading idler wheel.

13. The apparatus of claim 6 wherein said drive wheel is at least one and one half times as large in diameter as the diameter of said trailing idler wheel.

14. The apparatus of claim 13 wherein said continuous flexible track has lugs disposed around the center and inner periphery thereof, said lugs being spaced from the outer edges of said track and wherein said drive wheel is substantially only as wide as the lugs on said flexible track.

15. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track;

a leading idler arm operably pivotally attached to said frame;

a leading idler wheel in engagement with said track and rotatably mounted to one end of said leading idler arm;

a trailing idler arm operably pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to one end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms;

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position;

a second mid-roller assembly operatively attached to the other one of said idler arms; and

wherein the first said mid-roller assembly is pivotally attached to said leading idler arm and said second mid-roller assembly is pivotally attached to said trailing idler arm.

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16. A track suspension apparatus for a vehicle having a frame, comprising:

a continuous flexible track having a width and lugs disposed on the inner center portion of said track which have a length which is substantially shorter than the width of said track;

a drive wheel operatively attached to said frame for engaging and driving said continuous flexible track, said drive wheel being substantially the same width as the length of said lugs;

a leading idler arm operably pivotally attached to said frame;

a leading idler wheel in engagement with said track and rotatably mounted to one end of said leading idler arm;

a trailing idler arm operably pivotally attached to said frame;

a trailing idler wheel in engagement with said track and rotatably mounted to on end of said trailing idler arm;

a mid-roller assembly in engagement with said track and operatively attached to one of said idler arms; and

an interconnecting structure for holding said leading and trailing idler arms in a predetermined position.

ADDED CLAIMS:

17. A track apparatus for a vehicle having a frame, comprising:

-a continuous flexible track having an upper length and a ground-engaging lower length, the upper and lower lengths defining a vertical dimension therebetween;

-a drive wheel attached to the frame and having upper and lower circumferential portions and a diameter spanning a majority of the vertical dimension, the upper circumferential portion engaging the upper track length and the lower circumferential portion spaced above the lower track length;

-a leading idler assembly attached to the frame and having a leading idler arm and a leading idler wheel engaging the track and rotatably mounted to the distal end of the leading idler arm;

-a trailing idler assembly attached to the frame and having a trailing idler arm and a trailing idler wheel engaging the track and rotatably mounted to the distal end of the trailing idler arm; and

-a mid-roller assembly in engagement with the track lower length and attached to one of the idler arms.

18. The track apparatus of claim 17 wherein the drive wheel diameter is at least one and a half times the diameter of the leading idler wheel.

19. The track apparatus of claim 17 wherein the drive wheel diameter is at least one and a half times the diameter of the trailing idler wheel.

20. The track apparatus of claim 17 wherein the space between the lower circumferential portion of the drive wheel and the lower track length is less than half the diameter of the drive wheel.

21. The track apparatus of claim 17 wherein the mid-roller assembly includes at least one mid-roller and the space between the lower circumferential portion of the drive wheel and the lower track length is less than the diameter of the mid-roller.

22. The track apparatus of claim 21 wherein the mid-roller assembly includes at least two axially-offset mid-rollers, including at least one on either side of the drive wheel.

23. The track apparatus of claim 22 wherein the mid-roller assembly includes a plurality of mid-rollers on both sides of the drive wheel.

24. The track apparatus of claim 17 wherein the mid-roller assembly includes at least one mid-roller and the drive wheel extends below the top level of the mid-roller.

25. The track apparatus of claim 24 wherein the mid-roller assembly includes at least two axially-offset mid-rollers, including at least one on either side of the drive wheel.

26. The track apparatus of claim 25 wherein the mid-roller assembly includes a plurality of mid-rollers on both sides of the drive wheel.